DOCUMENT RESUME

ED 125 390 HE 007 859

AUTHOR Sandell, Steven H.
TITLE The Demand for College: The Effect of Local Colleges on Attendance.
SPONS AGENCY Ohio State Univ., Columbus. Center for Human Resource Research.
PUB DATE 76
NOTE 36p.; Paper presented to the American Educational Research Association (San Francisco, Calif., April, 1976)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Community Colleges; *Educational Demand; Enrollment; *Enrollment Trends; *Higher Education; *Human Capital; *State Colleges; Student Characteristics; Student Recruitment; Student Research

ABSTRACT

The effect of local public colleges on total higher education enrollment is examined in this study. While it is apparent that these colleges have attracted many students to their classrooms, this study attempts to find out both how many of these students would have attended other colleges and how many would not have attended at all had the local college not been available. This is done by developing and estimating a demand for an educational model using a human capital framework. The National Longitudinal Surveys provide the opportunity to investigate several important issues related to the attendance decision. The availability of data on family background (including family income), ability, existence of public and private colleges in their area of residence, measures of college quality, and the cost of college attendance allow an examination of the demand for college attendance. The determinants of desired, expected, and actual college attendance for young men and women are examined separately for blacks and whites. Based on the parameter estimates of the model, it is determined that the vast majority of students at local public colleges would have attended other colleges had the local ones not existed. However, the existence of a local two-year public college is associated with greater college attendance among white women and black men. (Author/JMF)

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The Demand for College: The Effect of Local Colleges on Attendance

by

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*This paper was prepared for presentation to the American Educational Research Association, San Francisco, April 1976.

The author is grateful for financial support from the Center for Human Resource Research and the research assistance of Daniel Gressel, Rex Johnson, and Marc Parnes. He thanks but also does not implicate his friends and colleagues at Ohio State University especially A. Kohen, J. Grasso, H. Parnes and D. Sanders for their comments on an earlier draft of this paper.

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By 1975, 79 percent of the 11 million college students in the United States were enrolled in publicly controlled colleges; many attended new or expanded two-year and four-year colleges established in large population centers.[1,2] In view of the financial problems currently faced by many private colleges, it is important to extend our knowledge about the effect of the existing higher education system on enrollment.[3] State or municipally run colleges subsidize higher education indirectly by providing instructional services that cost more to produce than the tuition students pay. The current system of educational finance results in allocation of resources that is neither socially efficient or equitable.[4]

This paper examines the effect of local public colleges on total enrollment in higher education. While it is apparent that these colleges have attracted many students to their classrooms, it is important to find out both how many of them would have attended other colleges and how many would not have attended at all had the local college not been available.[5] To answer this question we develop and estimate a demand for education model using a human capital framework.

From an economic perspective an individual will invest in a college education if the anticipated rate of return is higher than the cost of funds used in the investment. Since for any given level of earnings the rate of return is inversely related to the direct cost of college attendance, and since tutuition subsidies and the savings in the cost of room and board enable students enrolled at a local public college to reduce the direct cost of their education, the existence of a college in

a community is expected to have a positive effect on enrollment. In addition, becuase the interest rate individuals pay to finance their higher education is inversely related to their families' financial resources, the lower funding associated with attending a local public college compared with other institutions of higher education implies greater enrollment incentive for persons from poor compared to rich families.

The National Longitudinal Surveys provide the opportunity to investigate several important issues related to the attendance decision.[6] The determinants of desired, expected and actual college attendance for young men and young women are examined separately for blacks and whites Based on the parameter estimates of our model we find that the vast majority of students at local public colleges would have attended other colleges had the local ones not existed.

This paper is organized in the following manner: Section II presents an economic model of the demand for education. Section III estimates the model using the National Longitudinal Surveys of Young Men (1966-1969) and Young Women (1968-1971). Some conclusions are presented in Section IV.

II. A Model of the Demand for Higher Education

The price an individual is willing to pay for funds to be used in an investment in a college education is equal to the internal rate of return on that investment.[7,8] This relationship, a demand curve for funds to finance investment in human capital, is shown as curve D on

The Demand and Supply of Funds for an Individual's

Investment in Higher Education

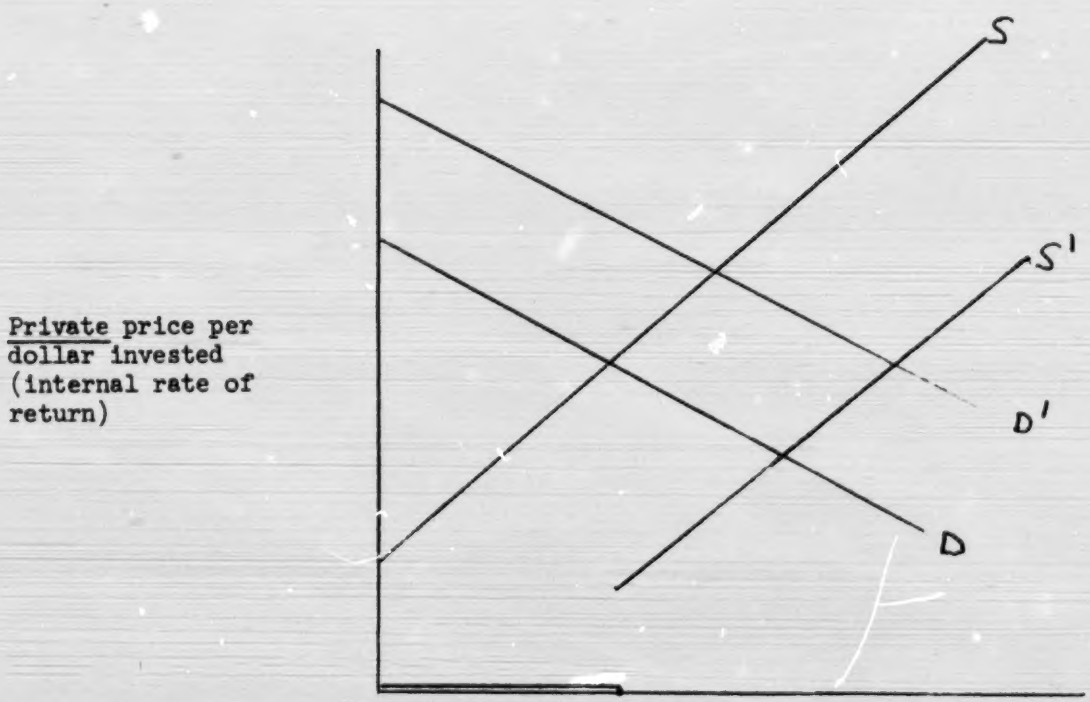

Diagram I

on Diagram I.[9] An individual financing his college education might choose to first reduce consumption expenditures or use savings before borrowing money at higher interest rates from a bank. Hence, he faces an upward sloping supply curve for funds that could be used for investment in higher education (S on Diagram I). In this framework, we can examine the effect of ability, tuition subsidies, reduced living costs, and differences in family financial circumstances on the demand for places in college.

If people with higher ability are better able to convert a unit of education into higher labor market productivity (hence, higher earnings), the rate of return to an incremental unit of education is higher the greater the person's native intelligence. Also, if scholarships are awarded on the basis of ability, persons with higher ability are able to reap a higher rate of return by obtaining the same education at a lower (private) direct cost. Hence, the height of the demand curve for investment funds is positively correlated with individual ability.

The stream of net benefits and the private rate of return increase with the reduction of tuition or room and board costs. Therefore, the price that an individual would be willing to pay to borrow funds per (unsubsidized dollar) unit of education is increased. The demand curve shifts up from D to D'.

Imperfections in the capital market exist partly becuase human capital cannot be used as collateral and because there is considerable uncertainty about the future earnings of a single person. If a person is able to finance his education from his own or his family's savings, the interest foregone for an incremental unit of funds is lower than the

price he would have to pay for funds from commercial sources. Hence, the height of the supply curve of investment funds is negatively correlated with permanent family income.[10]

Investment in a college education is rational if the cost of funds used for the investment is less than the internal rate of return. Attendance at a local public college is associated with a higher private rate of return per (unsubsidized) dollar of educational expenditure, an upward shift of the demand curve. Since the cost of financing the subsidized (free) part of the education is zero with the marginal (finance) cost of the remainder of the investment corresponding to the marginal cost of the least expensive financing as before, local public college attendance also implies a shift in the supply curve of investment funds down and to the right (S to S'). Hence, by increasing the private rate of return and lowering the private cost of financing a college education, the investment becomes more attractive; some individual will invest who would have chosen not to obtain higher education if the only colleges open to them were expensive and out of town. The availability of low tuition local colleges enables these persons to attend college.

Parental subsidies must be considered in analyzing the effect of local public colleges on attendance. Direct parental contributions increase the children's private rate of return to college the same way any outside reduction of the cost of college does. Secondly, parental loans below market interest also serve as an additional inducement for college attendance.

While it is clear that the availability of local public institutions could induce greater attendance by making college more profitable for

persons who otherwise would not have attended, the existence of local public colleges probably induces other behavioral changes. In the first place, some persons who, in the absence of alternatives, would attend private, high-tuition, out-of-town colleges would choose a local public college if the latter were available.[11] Investment in local public college education is often more profitable than investment in a private, residential college education. Attendance at local colleges would be more likely if parental subsidies were contingent upon obtaining the least expensive college education. That is, to induce their children to attend the local college, parents might refuse to subsidize attendance at a more expensive alternative. The relative price effect stemming from the removal of the parental subsidy for residential college attendance combined with the implicit (parental) room and board subsidy and the (government) tuition subsidy usually available at local public colleges induces substitution in favor of attendance at these schools.

III. Empirical Analysis

The empirical analysis involves estimating a demand function for college attendance. Using the National Longitudinal Surveys of Young Men (1966-1969) and Young Women (1968-71) we can determine the effect of the existence of local colleges (the cost of college) on desired, expected, and actual college attendance.

The basic regression model is:

$$(1) \quad PC_i = A + bIQ_i + cY_i + dS_i + fN_i + u_i$$

where:

PC is a dummy variable with the value of one if the respondent actually attends (or desires or expects to attend) college, and zero otherwise

A is a constant

IQ is a measure of the respondent's mental ability during high school

Y is the income of the respondent's (parental) family

S is the number of years of education of the respondent's father or head of household

N is the number of siblings of the respondent

u represents the unexplained residual in the regression equation

b, c, d, and f represent the least squares regressors associated with IQ, Y, and S and N respectively

Table I presents three related aspects of the demand for college education. First the determinants of desired and expected college attendance are examined for high school students using data from the initial year of the National Longitudinal Surveys. Then the factors influencing the fulfillment of these desires and expectations are examined using data on actual college attendance from the later surveys.

To obtain an estimate of the effect of various types of local colleges on the demand for higher education, a series of dichotomous variables is used to represent types of institutions. Each of these receives the value of one if the particular type of college was located (in 1965) in the respondent's local area of residence, and zero otherwise. The regression coefficients of these variables measure the net effects

of the existence of colleges in the local area on the probability of desired, expected, or actual college attendance. The regression results for samples stratified by race and sex are presented in Table 1. Table 2 presents separate analyses of the effect of local two-year and four-year public colleges on actual attendance.

The results from estimating the regression model in each of the four samples are consistent with human capital theory. Youth from families with greater financial resources are likely to receive larger parental subsidies toward their college education, and face a lower effective rate of interest on their investment. Hence, we expect (and usually observe) a negative coefficient on number of siblings and a positive coefficient on average family income.[13] As expected, for all groups we observe a significant positive coefficient on our measure of the respondent's mental ability. We interpret the positive coefficient for father's scholastic attainment as representing the transmittal of a positive taste for education from parents to children. In our sample of high school students, the regression coefficients usually have the same sign for all three dependent variables (desired, expected and actual college attendance)

The magnitudes of the coefficients for white males are systemmatically lower for the regression model that explains desired college attendance than for expected and actual attendance. It is interesting to note that the impact of measured ability is stronger (the regression coefficient is larger) in predicting actual as compared with expected or desired college attendance. The existence of a college in the community does not

Table 1A Regression Results: Determinants of Desired, Expected and Actual College Attendance for White Men[a,b]

(t - statistics in parentheses)

Independent Variable	Dependent Variable					
	DESANY		EXPANY		ACTCOL	
Constant	-.261 (-2.50)**	-.245 (-2.33)**	- .688 (- 6.27)**	-.676 (-6.10)**	- 1.05 (- 9.04)**	- 1.03 (- 8.79)**
Father's education $X10^{-1}$	.225 (4.88)**	.223 (4.81)**	.318 (6.52)**	.316 (8.72)**	.229 (4.43)**	.225 (4.36)**
Family income $X10^{-5}$	.645 (2.26)*	.598 (2.07)*	.985 (3.27)**	.936 (3.07)**	1.053 (3.30)**	.967 (3.00)**
Respondent's IQ $X10^{-2}$	.712 (7.30)**	.704 (7.19)**	.905 (8.80)**	.899 (8.72)**	1.167 (10.72)**	1.158 (10.60)**
Siblings $X10^{-1}$	-.209 (-3.23)**	-.208 (-3.21)**	- .188 (- 2.76)**	-.186 (-2.74)**	- .258 (- 3.58)**	- .256 (- 3.54)**
Any college	.012 (0.39)		$-.477 \times 10^{-3}$ (- 0.01)		.002 (0.05)	
Public colleges only		-.017 (-0.37)		-.018 (- 0.38)		- .030 (- 0.61)
Private colleges only		.0007 (0.02)		-.024 (- 0.56)		- .037 (- 0.84)
Both public and private colleges		.027 (0.80)		.016 (0.45)		.031 (0.85)
R^2(adjusted)	.16	.16	.23	.23	.23	.23
S.E.E.	.39	.39	.41	.41	.44	.44
F-Ratio	36.5	26.3	56.6	40.6	57.8	41.9

a Universe: NLS of white men age 14-24, in grades 10-12 in 1966 and no record of marriage during the first year of college attendance.

(Table continued on next page.)

Table 1A -- Continued

Sample size = 947
* Significant at .05.
** Significant at .01.

Table 1B Regression Results: Determinants of Desired, Expected and Actual College Attendance for Black Men[a,b]

(t - statistics in parentheses)

Independent Variable	Dependent Variable					
	DESANY		EXPANY		ACTCOL	
Constant	-.131 (-0.58)	-.128 (-0.57)	-.320 (-1.30)	-.309 (-1.26)	-.168 (-0.69)	-.185 (-0.76)
Father's education $X10^{-1}$	.249 (2.46)**	.220 (2.19)*	.226 (2.06)*	.198 (1.81)*	.151 (1.39)	.144 (1.32)
Family income $X10^{-5}$	1.168 (1.37)	.932 (1.06)	.456 (0.49)	.144 (0.15)	.915 (1.00)	1.044 (1.10)
Respondent's IQ $X10^{-2}$	.716 (3.21)**	.733 (3.33)**	.931 (3.86)**	.941 (3.92)**	.479 (2.00)*	.498 (2.08)*
Siblings $X10^{-1}$	-.169 (-1.42)	-.144 (-1.22)	-.215 (-1.68)*	-.185 (-1.43)	-.206 (-1.62)	-.214 (-1.66)*
Any college	-.008 (-0.09)		-.041 (-0.42)		-.032 (-0.32)	
Public colleges only		.135 (1.12)		.055 (0.42)		.093 (0.71)
Private colleges only		-.126 (-1.22)		-.156 (-1.38)		-.060 (-0.53)
Both public and private colleges		.033 (0.34)		.011 (0.10)		-.050 (-0.47)
R^2 (adjusted)	.18	.20	.17	.18	.08	.08
S.E.E.	.42	.41	.45	.45	.45	.45
F-Ratio	8.9	7.5	8.5	6.8	4.2	3.3

a Universe: NLS of white men age 14-24, in grades 10-12 in 1966 and no record of marriage during the first year of college attendance.

Sample size = 183

* Significant at .05

** Significant at .01

Table 1C Regression Results: Determinants of Desired, Expected and Actual College Attendance for White Women[a,b]

(t - statistics in parentheses)

Independent Variable	Dependent Variable					
	DESANY		EXPANY		ACTCOL	
Constant	- .333 (-2.44)**	- .351 (-2.58)**	- .542 (-3.79)**	- .553 (-3.87)**	-1.10 (-7.25)**	-1.13 (-7.47)**
Father's education $X10^{-1}$	.197 (3.48)**	.199 (3.50)**	.264 (4.41)**	.265 (4.44)**	.393 (6.20)**	.398 (6.32)**
Family income $X10^{-5}$	.910 (2.64)*	.939 (2.67)**	1.22 (3.39)**	1.25 (3.40)**	.665 (1.74)*	.574 (1.47)
Respondent's IQ $X10^{-2}$	.756 (6.21)**	.769 (6.31)**	.794 (6.23)**	.801 (6.27)**	.989 (7.31)**	1.02 (7.55)**
Siblings $X10^{-1}$	- .127 (-1.59)	- .131 (-1.64)	- .152 (-1.81)*	- .155 (-1.85)*	- .067 (- .692)	- .067 (- .684)
Any college	-.0199 (- .553)		- .017 (-0.448)		-.0038 (-0.094)	
Public colleges only		.0685 (1.33)		.044 (.820)		.084 (1.48)
Private colleges only		.0646 (-1.39)		-.0437 (- .894)		- .097 (-1.89)*
Both public and private colleges		- .030 (- .753)		- .026 (- .623)		.013 (.295)
R^2 (adjusted)	.14	.14	.18	.18	.20	.21
S.E.E.	.40	.40	.42	.43	.46	.44
F-Ratio	22.7	17.2	29.7	21.6	35.1	26.8

(Table continued on next page.)

Table 1C -- Continued

a Universe: NLS of white women age 14-24, in grades 10-12 in 1968 and no record of marriage during the first year of college attendance.

Sample size = 673

* Significant at .05.

** Significant at .01.

Table 1D Regression Results: Determinants of Desired, Expected and Actual College Attendance for Black Women[a,b]

(t - statistics in parentheses)

Independent Variable	Dependent Variable					
	DESANY		EXPANY		ACTCOL	
Constant	-.299 (-1.29)	-.369 (-1.54)	-.523 (-2.14)*	-.596 (-2.38)**	-.816 (-3.80)**	-.928 (-4.26)**
Father's education $X10^{-1}$	.204 (1.93)*	.225 (2.11)	.348 (3.15)**	.372 (3.32)**	.189 (1.95)*	.222 (2.28)*
Family income $X10^{-5}$	.481 (.418)	1.06 (.85)	.412 (.34)	1.09 (.84)	1.40 (1.32)	2.26 (1.99)*
Respondent's IQ $X10^{-2}$	.677 (2.87)**	.719 (3.02)*	.814 (3.30)**	.857 (3.48)**	.696 (3.22)**	.764 (3.54)**
Siblings $X10^{-1}$	.211 (1.85)	.210 (1.83)	.148 (1.25)	.142 (1.19)	.145 (1.39)	.148 (1.42)
Any college	.145 (1.54)		.071 (.73)		.156 (1.81)*	
Public colleges only		.127 (1.05)		.078 (.61)		.104 (.94)
Private colleges only		.204 (1.92)*		.125 (1.13)		.256 (2.66)**
Both public and private colleges		.073 (.65)		-.015 (- .13)		.493 (.48)
R^2 (adjusted)	.10	.10	.14	.14	.15	.17
S.E.E.	.43	.43	.45	.45	.393	.39
F-Ratio	4.5	3.5	6.4	4.8	6.7	5.7

a Universe: MS of black women age 14-24, in grades 10-12 in 1968 and no record of marriage during the first year of college attendance.

Sample size = 160

* Significant at .05.

** Significant at .01.

Table 1 -- Continued

b Means (standard deviation) for Determinants of Desired, Expected and Actual College Attendance.

Variable Definitions	Young Men		Young Women	
	WHITES	BLACKS	WHITES	BLACKS
Respondent's father's education	10.95 (3.29)	8.20 (3.66)	11.46 (3.27)	7.92 (3.70)
Respondent's family's average income 1965-69 (in 1967 dollars)	11,337 (5,202)	7,156 (4,053)	11,703 (5,388)	6,163 (3,489)
Respondent's IQ (from high school record)	105.36 (14.00)	87.96 (15.0)	106.49 (13.31)	87.96 (15.11)
Respondent's total number of siblings, 1966 (men), 1968 (women)	2.85 (2.00)	4.72 (2.83)	2.96 (1.96)	5.34 (3.20)
Any college in locality (Dummy variable coded '1' if there is any college present in area of residence), 1966 (men), 1968 (women)	.78 (.41)	.85 (.36)	.74 (.44)	.82 (.39)
Public college(s) only (Dummy coded '1' if present)	.13 (.34)	.13 (.33)	.14 (.35)	.14 (.35)
Private college(s) only (Dummy coded '1' is present)	.19 (.39)	.23 (.43)	.19 (.39)	.25 (.43)
Both public and private college(s) (Dummy coded '1' if both are present)	.46 (.50)	.49 (.50)	.41 (.49)	.43 (.49)
DESANY (Dummy coded '1' if respondent desires education beyond high school) 1966 (men), 1968 (women)	.76 (.43)	.70 (.46)	.75 (.43)	.72 (.45)
EXPANY (Dummy coded '1' if respondent expects education beyond high school)	.67 (.47)	.58 (.49)	.69 (.42)	.63 (.48)
ACTCOL (Dummy coded '1' if respondent attends college the year following grade 12)	.48 (.50)	.32 (.47)	.46 (.50)	.24 (.43)

Table 2A Regression Results: The Effect of Two-Year and Four-Year Local Public Colleges on Actual College Attendance of Young Men

(t - statistics in parentheses)

Independent Variable	WHITE men[a,b]	WHITE men[a,b]	BLACK men[b,c]	BLACK men[b,c]
Constant	- 1.05 (- 9.00)**	- 1.04 (- 8.85)**	- .252 (- 1.05)	- .197 (- 0.80)
Father's education $X10^{-1}$	.228 (4.41)**	.227 (4.38)**	.134 (1.25)	.160 (1.47)
Family income $X10^{-5}$	1.045 (3.25)**	1.015 (3.15)**	1.191 (1.30)	1.093 (1.15)
Respondent's IQ $X10^{-2}$	1.168 (10.70)**	1.159 (10.60)**	.568 (2.39)**	.498 (2.07)*
Respondent's total number of siblings $X10^{-1}$	- .258 (- 3.57)**	- .255 (- 3.52)**	- .207 (- 1.65)*	- .215 (- 1.67)*
Public 2 year college only	.005 (0.06)		.315 (2.00)*	
Public 2 year and others	.012 (0.28)		- .071 (- 0.61)	
No public 2 year college	- .003 (- 0.07)		- .057 (- 0.58)	
Public 4 year college only		- .021 (- 0.36)		- .116 (- 0.68)
Public 4 year and others		.016 (0.44)		- .064 (- 0.60)
No public 4 year college		- .013 (- 0.32)		.009 (0.09)
R^2 (adjusted)	.23	.23	.11	.08
S.E.E.	.44	.44	.44	.45
F-Ratio	41.2	41.4	4.2	3.2

(Table continued on next page.)

Table 2A -- Continued

a Universe: NLS of white men age 14-24 in grades 10-12 in 1966 and no record of marriage during the first year of college attendance.

b See Table 1 for summary statistics.

c Universe: NLS of black men age 14-24 in grades 10-12 in 1966 and no record of marriage during the first year of college attendance.

* Significant at $\alpha = .05$.

** Significant at $\alpha = .01$.

Table 2B Regression Results: The Effect of Two-Year and Four-Year Local Public Colleges on Actual College Attendance of Young Women

(t - statistics in parentheses)

Independent Variable	WHITE women[a,b]	WHITE women[a,b]	BLACK women[b,c]	BLACK women[b,c]
Constant	- 1.12 (- 7.47)**	- 1.10 (- 7.24)**	- .883 (- 4.02)**	- .855 (- 3.92)**
Father's education	.039 (6.35)**	.039 (6.20)**	.021 (2.14)*	.019 (1.94)*
Family income	.674 (1.76)*	.602 (1.53)	1.590 (1.49)	1.694 (1.47)
Respondent's IQ	1.000 (7.51)**	.994 (7.34)**	.75 (3.42)**	.732 (3.35)**
Respondent's total number of siblings X10^{-1}	- .075 (- .851)	- .054 (- .603)	.148 (1.42)	.141 (1.33)
Public 2 year college only	.226 (2.46)**		.153 (.914)	
Public 2 year and others	.058 (1.12)		.401 (.346)	
No public 2 year college but others	- .047 (- 1.13)		.173 (1.98)*	
Public 4 year college only		.014 (.210)		.054 (.434)
Public 4 year and others		.019 (.238)		.116 (1.10)
No public 4 year college but others		-.0258 (- .546)		.204 (2.21)*
R^2 (adjusted)	.22	.20	.15	.15
S.E.E.	.44	.44	.39	.39
F-Ratio	27.4	25.2	5.1	5.1

(Table continued on next page.)

Table 2B -- Continued

a Universe: NLS of white women age 14-24, in grades 10-12 in 1966 and no record of marriage during the first year of college attendance.

b See Table 1 for summary statistics.

c Universe: NLS of black women age 14-24 in grades 10-12 in 1966 and no record of marriage during the first year of college attendance.

significantly affect college aspirations, expectations or actual attendance of white males.[14] The presence of a two-year public college is associated with a significantly higher likelihood of college attendance for black men.

The parameter estimates of the model, however, are different for each race/sex group. In the first place, for both men and women the explanatory power of the model, as measured by the adjusted R^2 is usually higher for whites than blacks. The human capital model is more successful in explaining college attendance of men than women for whites while the reverse is true for blacks.

For white women, the coefficients of mental ability and father's education on the demand for college is higher when the dependent variable is based on actual compared to desired college attendance. However, family income is more important in explaining desired college attendance than actual attendance. On the other hand, for black women the pattern is reversed. The coefficient for the family income variable is twice as large in the actual attendance equations compared with those explaining desired attendance. The mental ability and father's education coefficients are approximately the same, respectively, in the desired and actual attendance equations. Ability seems to be less important and family income more important in explaining the actual college attendance of black compared with white women. The existence of a two-year public college is associated with a significantly higher likelihood that a white woman will enter college. Black women who live in communities that contain a private college are more likely than other black women to continue their education beyond high school.

In a variant of model (1), not reported here a variable that represents the amount of reading material in the respondent's home at age 14 and a variable that indicates parents and teachers encouraged the respondent to attend college had the expected positive effects on desired, expected and actual college attendance. The encouragement variables are significant and positive in equations that include ability, family income and father's education as independent variables. Since the more intelligent children and those from the upper socioeconomic groups are most likely to be urged to attend college, it is not surprising that the coefficients for IQ, family income and father's education are reduced when the encouragement variables are included in the model.

The coefficients of the local college variables show that proximity to a public college has only a minimal effect on enrollment.[15] One factor useful in explaining these results is that foregone earnings represent a substantial protion of the total cost of a college education.

Since the $300 to $400 per year savings concomitant with attending a local public college instead of a public residential college is small relative to the total cost of college, it usually does not change the decision to seek post-secondary education.[16]

Since our finding of minimal impact of local public colleges on enrollment is somewhat surprising and a key focus of this paper, additional empirical procedures were utilized in an attempt to identify enrollment effects. First, using model (1), actual college attendance regressions were estimated separately for samples of persons who did not have public colleges in their (parents') place of residence and also for samples of

persons living in areas where public colleges were located.[17] Second, data were stratified into low and high income groups (by sex and race) and separate regression analyses conducted for each group. The results from using these additional techniques are consistent with earlier findings.

Another approach to the same question involves examining the personal characteristics of youth who were actually attending local public colleges, and estimating the probability that these students would have received higher education, had the local college not been available. These predictions are based upon the coefficients of a regression equation estimated for a sample of persons who did not have a public college located in their area of residence. That is, multiplying a vector of the personal characteristics of local public college students by the vector relating those characteristics to the probability of college attendance, the likelihood of attendance can be estimated. We use a 50 percent likelihood criteria.

Table 3 shows that based on their ability, parental income, number of siblings and father's education, more than 56 percent of the white men and 47 percent of the white women who attended a local public college during the survey years would have obtained post-secondary education even if they had not lived in an area that contained a public college. An additional 34 percent of the men and 44 percent of the women had an estimated likelihood between 25 and 50 percent and mean likelihoods of 40 and 39 percent, respectively. Seventy-four of the 99 male and 53 of the 79 female local college students who

would not have enrolled, had measured ability below the mean for white high school students.

The Timing of Enrollment Decisions

We have thus far demonstrated that the enrollment inducement effect of local public colleges is minimal among recent high school students.[18] If plans to attend college are made early in a person's life, these findings are reasonable. If the decision to attend is reached upon entrance rather than completion of high school, the proximity of a public college could be a determinant of where the student attends college rather than whether he goes. Evidence supporting the view that the likelihood of college attendance is substantially determined as early as the ninth grade is obtained from regression results for a sample of white high school students who followed the college preparatory curriculum. The summary statistics show that 73 percent of these young white men who sought an academic diploma compared to less than 50 percent of all high school men enrolled in an institution of higher education within one year after graduation from high school. The magnitude of the regression coefficients and the explanatory power of the human capital variables are smaller within the academic curriculum group than in regressions estimated using a sample of all high school students.[19]

Since the choice of high school curriculum, a key determinant of college enrollment, is made at an early age and is heavily influenced by parents, serious questions are raised concerning the human capital model that has been presented. In the model, the college attendance decision, associated with wealth maximization, is assumed to be made

Table 3 Distribution of Sample Cases by Likelihood of Residential College Attendance[a] and Ability[b] among Actual Local Public College Students

WHITE MEN					
Ability \ Probability of attendance	Total	Less than 25 percent	25 to 49.9 percent	50 to 74.9 percent	Greater than 75 percent
Total	236	20	79	105	32
Substantially below average	25	13	11	1	0
Slightly below average	80	5	45	29	1
Slightly above average	91	2	20	55	14
Substantially above average	40	0	3	20	17

WHITE WOMEN					
Ability \ Probability of attendance	Total	Less than 25 percent	25 to 49.9 percent	50 to 74.9 percent	Greater than 75 percent
Total	150	13	66	64	7
Substantially below average	15	9	6	0	0
Slightly below average	51	4	34	12	1
Slightly above average	62	0	24	37	1
Substantially above average	22	0	2	15	5

Source: Appendix Table 1 and Characteristics of Individual Local Public College Students

a,b See Table 1, footnotes a and b for variable descriptions.

by high school seniors. At least two interpretations of the results from the stratified sample are possible. First, parents make the college investment decisions on behalf of their children based on the child's ability and on family financial resources. Second, college enrollment is actually determined by educational "channeling" a process with an outcome that is, coincidentally, consistent with the predictions of the conventional human capital model. Under either interpretation, it is clear that the decision to pursue education beyond high school is for the most part made before the student reaches grade twelve. It is not surprising, then, that the proximity of a public college during the respondent's high school years does not seem to be a major inducement for college enrollment.

If local public colleges do not have as large an attendance inducement effect as their supporters ascribe to them, why have they been established? One possible explanation is that parents who expect their children to enroll in college often prefer them to attend locally. That is, they are likely to live in areas where local colleges exist or they will provide political pressure for their establishment in the local area.

IV. Conclusions

We observe only limited additional college enrollment associated with the existence of local public colleges. Local two-year public colleges increase the likelihood that white women and black men will seek higher education. While this result was unexpected, it is consistent with some previous research (Hopkins) and probably due to the limited effect of attending a local college on the total cost of investment in higher education when opportunity costs are included.

Furthermore, while the human capital model is consistent with data, we have uncovered evidence that the college attendance decision is often "made" at the time the student enters high school. That is, high school curriculum (i.e., academic compared to other) "explains" a large portion of the variance in college enrollment demand among individuals. Hence, the decision to go to college is made or at the very least heavily influenced by parents.

FOOTNOTES

[1]New York Times, February 15, 1976, p. E 7

[2]Tuckman (1973, p. 266) reports that 60 percent of the 400 colleges built during the 1960s were junior colleges.

[3]Dr. T. Edward Hollender, New York State's deputy commissioner for higher education predicts that by 1990 one-third of New York's private institutions "may find themselves with enrollment declines that might cause them to reconsider whether they should continue." New York Times, February 29, 1976, p. 1.

[4]Shultz (1972), p. 2.

[5]Some supporters of local colleges pretend to know the answer to this question. For example, Albert Shanker, President of the United Federation of Teachers arguing against budget cuts for the City University of New York stated, "The list of graduates who might not otherwise have been able to go to college--but who went to the city colleges and later made outstanding, internationally recognized contributions to the arts and sciences--is staggering." (New York Times (advertisement) February 15, 1976), p. E 7

[6]A description of these data is contained in "The National Longitudinal Surveys Handbook", The Center for Human Resource Research, The Ohio State University, October, 1975.

[7]Of course, college attendance may contain present or future consumption benefits. We posit these benefits to be independent of the investment aspects and ignore them for the remainder of the present analysis.

[8]The internal rate of return is the rate of interest that equates the direct plus opportunity (foregone earnings) costs associated with a college education with the increase in lifetime earnings stemming from the investment.

[9]This diagram was first used by Becker (1967).

[10]This is offset somewhat since scholarships, and government guaranteed low interest loans are often awarded on the basis of need.

[11]If private high-tuition colleges are superior to public local colleges, some persons might attend the former even if places in the latter were available. That is, to the extent that certain attributes of colleges imply higher lifetime earnings or larger present or future consumption benefits, attendance at expensive private colleges will occur even if the direct cost of local public college attendance were lower. This aspect of college choice is the subject of a future paper.

[12]Other factors have been included in previous studies of educational aspirations and attachment. These include: high school curriculum, encouragement by parents and teachers, reading material in the home, high school quality, etc. Since many of these variables introduce behavioral aspects (i.e., students with greater ability receive more encouragement), they have been excluded from the simple economic model presented initially.

[13]Since permanent income is a more appropriate measure of parental financial capacity than current income, our measure is the average reported family income (in 1967 dollars) for the available survey years.

[14]Since the estimates of the desired and expected equations have provided little additional insight into the college attendance decision, the remainder of the empirical results in this paper will be concerned only with actual college attendance.

[15]Hopkins (1974).

[16]Suchar et al. (1974) p. V.

[17]These results are presented in the appendix.

[18]It is possible that local public colleges augment attendance among older persons. In fact, a local college provides a community with cultural and educational activities that can justify its establishment irrespective of enrollment effects.

[19]The following regression equation was estimated using a sample of 418 white men who followed a college preparatory curriculum in high school:

$$\text{Probability of Actual College Attendance} = -\underset{(-.98)}{.194}$$

$$+\underset{(1.52)}{.0119}\ \text{Fathed} \quad +\underset{(4.10)}{.00070}\ \text{IQ} \quad -\underset{(-1.46)}{.0174}\ \text{Siblings}$$

$$-\underset{(-.66)}{.0384}\ \text{Anycol} \quad +\underset{(1.38)}{.608 \times 10^{-5}}\ \text{Faminc}$$

$$R^{-2} = .059, \quad \text{S.E.E.} = .429, \quad \text{F-ratio} = 6.2$$

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APPENDIX

In order to examine in more detail the impact of local public colleges on attendance, the following technique is used: first, equation (1) is estimated using a sample of persons who do not have local public colleges in their (parents) place of residence and for a sample of persons living in areas where local public colleges exist. Second, using the coefficients from the regression equations from one sample (e.g., where a public college is present) and mean values for the independent variables from the other sample (e.g., where no local college is present) the likelihood of college attendance is estimated for persons with these characteristics. By comparing the results for the two samples, a good measure of the impact of local public colleges on actual college attendance is obtained. The regression equations are estimated separately by race and sex.

Using the mean values for white men who reside in areas without a local public college, and the regression coefficients from the determinants of college attendance equation estimated from a sample of white men (blacks) who reside in an area with a local public college, we obtain a probability of college attendance of .464 (.280). Since the probability of actual attendance for this group was .429 (.243), it seems then the existence of a local public college improves the probability of college attendance by .035 (.037). Using the mean values from the sample of whites (blacks) who had a local public college in their local area and regression coefficients from a sample without a local college, we

obtain a probability of attendance of .477 (.347). Since the actual mean attendance for this group was .507 (.363), we find the existence of a local college increases the probability of attendance by .030 (.016). Hence again we observe only insignificant enrollment inducement due to the existence of local colleges for men. Using the same procedure for women, we estimate that the existence of a local public college increases the likelihood of higher education for whites by 7 percent and not at all for blacks.

Appendix Table 1 Regression Results: Likelihood of Actual College Attendance by Race and Existence of Local Public Colleges[a]

Independent variables / Sample characteristics	WHITE MEN		BLACK MEN		WHITE WOMEN		BLACK WOMEN	
	Local public college present	No local public college present	Local public college present	No local public college present	Local public college present	No local public college present	Local public college present	No local public college present
CONSTANT	-1.06	-1.08	.040	-.502	-1.09	-1.15	-.855	-.653
	(-7.59)**	(-5.43)**	(.12)	(-1.63)	(-5.58)**	(-5.10)**	(-2.66)**	(-2.22)*
Father's education ($X10^{-1}$)	.147	.365	.124	.150	.427	.362	.171	.245
	(2.30)*	(4.13)	(.84)	(.99)	(5.06)**	(3.76)**	(1.11)	(1.89)*
IQ ($X10^{-1}$)	.125	.108	.023	.092	.099	.105	.076	.071
	(9.14)**	(5.98)**	(.68)	(2.74)**	(5.48)**	(5.13)**	(2.37)**	(2.35)**
Number of siblings ($X10^{-1}$)	-.220	-.296	-.162	-.290	-.009	-.126	.108	.145
	(-2.46)**	(-2.42)**	(- .88)	(-1.77)**	(-.083)	(-.875)	(.676)	(1.06)
Family income ($X10^{-5}$)	1.22	.708	.954	.202	.344	.729	3.07	.009
	(3.05)**	(1.32)	(.83)	(.12)	(.724)	(1.08)	(2.08)**	(.005)
R^2	.251	.196	.014	.179	.211	.183	.151	.081
S.E.E.	.433	.444	.480	.391	.445	.446	.413	.378
F-Ratio	47.1	24.7	1.4	4.8	25.8	17.8	5.0	2.5

* $\alpha \leq .05$.
*** $\alpha \leq .01$.

Appendix Table 1 -- Continued

a Means (standard deviation) for Determinants of Likelihood of Actual College Attendance.

Variable definition / Sample characteristics	WHITE MEN		BLACK MEN		WHITE WOMEN		BLACK WOMEN	
	Local public college present	No local public college present	Local public college present	No local public college present	Local public college present	No local public college present	Local public college present	No local public college present
Respondent's father's education	11.20 (3.50)	10.57 (2.92)	9.19 (3.43)	6.51 (3.39)	11.66 (.50)	11.21 (3.15)	9.05 (3.37)	6.42 (3.60)
Respondent's family's average income in 1965-69 (in 1967 dollars)	11998.40 (5401.83)	10387.66 (4749.17)	8200.72 (4235.52)	5469.13 (3086.91)	11661.29 (3349.10)	10413.06 (4484.27)	7654.25 (3612.73)	4315.29 (2258.35)
Respondent's IQ, 1966	105.72 (14.74)	104.84 (12.88)	89.18 (14.76)	85.99 (15.29)	105.87 (13.48)	107.26 (13.08)	91.15 (14.08)	83.75 (15.47)
Respondent's total number of siblings	2.79 (2.08)	2.93 (1.89)	4.34 (2.66)	5.34 (3.01)	2.92 (2.08)	3.02 (1.80)	4.85 (2.92)	5.99 (3.44)
ACTCOL (Dummy coded '1' if respondent attends college the year following grade 12)	.51 (.50)	.43 (.50)	.36 (.48)	.24 (.43)	.50 (.50)	.43 (.49)	.27 (.45)	.19 (.39)
Sample size	558	389	113	70	372	301	91	69